

Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1 - 28 (cancelled without prejudice)

29. (new) A fuel-air mixture device comprising:

a primary air passage having an inlet, an adjustable throttle mounted on a rotary shaft arranged transversely of said primary air passage and an outlet;

a secondary air passage having an inlet from said primary air passage between its inlet and its adjustable throttle and an outlet to said primary air passage between its adjustable throttle and its outlet;

a variable orifice nozzle for introducing fuel to said primary air passage, said nozzle having a mouth for dispensing fuel into said secondary air passage upstream of its outlet;

a tapered needle arranged radially of said primary air passage and positioned in said mouth to provide variability of said orifice by axial movement of said needle, said needle being arranged transversely of said primary air passage with its small diameter end directed towards said primary air passage, the arrangement being such that in use, said fuel mixes with air flowing through said secondary air passage prior to mixing with air flowing in said primary air passage;

a linkage mechanism for controlling the position of said needle to the position of said adjustable throttle in said primary air passage for adjustment of said orifice of said nozzle;

an actuator for said tapered needle acted on by said linkage, with said needle extending between said actuator and said fuel dispensing mouth of said nozzle, the arrangement being such that as said throttle is opened, said needle is moved away from said primary air passage and out of said mouth of said nozzle to match fuel flow from said nozzle to said position of said adjustable throttle; and

an apertured vaporisation block having a plurality of air passageways through said block, which subdivide a longitudinal portion of said primary air passage between said fuel introduction position and said outlet, the arrangement being such that fuel, air flowing through the secondary air passage and air flowing through said primary air passage all pass through said air passages for mixture of the fuel and the air; and wherein said linkage maintains a cam plate carried on said transverse, throttle-carrying shaft and having a cam surface directed towards said primary air passage, with said actuator for said tapered needle bearing against said cam plate.

30. (new) A fuel-air mixture device according to claim 29, including a spring for lifting said needle from said mouth of said nozzle, under control of said cam plate, as said throttle is opened.

31. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block is integral with a member defining said primary air passage.

32. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block is a member fitted to said primary air passage.

33. (new) A fuel-air mixture device according to claim 32, wherein said aperture vaporization block is mounted in such manner as to be ultrasonically excitable.

34. (new) A fuel-air mixture device according to claim 33, wherein said apertured vaporisation block is mounted in an ultrasonically excitable ring.

35. (new) A fuel-air mixture device according to claim 33, wherein said passageways in said block are lined by ultrasonically excitable tubes.

36. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block is a solid block in which said air passageways are formed by machining or casting.

37. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block is laid up from a plurality of layers, preferably

by winding, said layers having regular formations extending out from each layer to space it from said next layer.

38. (new) A fuel-air mixture device according to claim 37, wherein said formations at each layer are continuous with said formations at the next.

39. (new) A fuel-air mixture device according to claim 37, wherein said formations at each layer are inter-spaced with said formations at the next.

40. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block is provided wholly downstream of the position of said fuel introduction means.

41. (new) A fuel-air mixture device according to claim 40, wherein an upstream face of said apertured vaporisation block is concavely formed, preferably conically.

42. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block is provided at and extending downstream of the position of said variable orifice nozzle.

43. (new) A fuel-air mixture device according to claim 29, wherein said apertured vaporisation block has at least one transverse bore leading from

said secondary air passage to a respective one of said air passageways through said block.

44. (new) A fuel-air mixture device according to claim 43, wherein each of said passageways has a transverse bore leading from said secondary air passage.

45. (new) A fuel-air mixture device according to claim 43, wherein some of said air passageways are not in communication with said secondary air passage, whereby they do not receive fuel-air mixture in use.

46. (new) A fuel-air mixture device according to claim 43, wherein some of said air passageways are in communication with said secondary air passage only via others of them.

47. (new) A fuel-air mixture device according to claim 42, wherein said fuel introduction needle extends into one or more of said air passageways in said apertured vapourisation block.

48. (new) A fuel-air mixture device according to claim 43, wherein said passageway or each said passageway having said transverse bore or each said bore is configured as a venturi with said narrowest throat being at said orifice(s) of said transverse bore.

49. (new) A fuel-air mixture device according to claim 43, wherein said passageway(s) have turbulence inducing formations downstream of said transverse bore(s), to aid mixture of the fuel with the air in said passageways.

50. (new) A fuel-air mixture device according to claim 29, wherein said needle actuator is accommodated in a fuel tight manner in a needle carrier and extends into a lubricant chamber where said cam plate acts on it.

51. (new) A fuel-air mixture device according to claim 50, wherein said needle is carried axially of said needle actuator and spring biased towards said primary air passage for closure of a fuel outlet orifice from said needle carrier to said primary air passage by engagement of a taper of said needle in said orifice.

52. (new) A fuel-air mixture device according to claim 51, wherein said needle carries an O-ring arranged to seal additionally said orifice with said needle.

53. (new) A fuel-air mixture device according to claim 50, wherein said needle carrier has an extension in communication with said primary air passage and said extension has two outlets from said secondary air passage into said extension.

54. (new) A fuel-air mixture device according to claim 53, wherein one of said outlets is from a slow running branch of said secondary air passage, having a slow running air flow adjustment and a second branch which is normally open, except when closed by a closure valve on closure of said throttle.

55. (new) A fuel-air mixture device according to claim 54, wherein said closure valve comprises a flat on a shaft of said throttle, which is arranged to open said branch when said throttle is open.